

## Claims:

*Sub D* 1. A method of manufacturing a paper of mono- and multi-colour ink-jet printable grade by de-watering a paper web from fiber pulp slurry, the method containing a step of adding a 2-oxetanone based size to the pulp slurry, the size being manufactured from greater number than one of fatty acids having a main chain comprising 6 to 22 carbons linked to each other by saturated bonds, and of which acids at least one is an acid with branched chain.

2. The method of claim 1, wherein the 2-oxetanone size is made from a mixture of a linear-chain and a branched-chain fatty acids.

3. The method of claim 1, wherein the 2-oxetanone size is made from a mixture of fatty acids with the proportion of linear-chain and branched-chain fatty acids in the order of 1 to 1.

4. The method of claim 1, wherein the 2-oxetanone size is made from a mixture of fatty acids with a fatty acid proportion of 40 % or higher of the at least one branched-chain fatty acid.

5. The method of claim 1, wherein the at least one branched-chain fatty acid is isostearic acid.

*sub C<sup>2</sup>* 6. ~~The method of claim 1, wherein the 2-oxetanone size is added in an amount of 0.05 to 0.25 of the fiber weight in the pulp slurry.~~

7. The method of claim 1 including further a step of adding a hydrophobizing size onto the de-watered web.

8. The method of claim 1 including further a step of

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adding a mineral filler material to the slurry.

9. The method of claim 8, wherein the filler material is calcium carbonate.

10. The method of claim 8, wherein the filler material is precipitated calcium carbonate.

11. The method of claim 1 conducted under neutral conditions.

12. The method of claim 1 conducted under alkaline conditions.

Sub 12  
13. A method of manufacturing a paper of mono- and multi-colour ink-jet printable grade from fiber pulp slurry into a paper web, the method containing a step of adding a size onto the paper web, wherein the size is a 2-oxetanone based size manufactured from greater number than one of fatty acids, the acids having a main chain comprising 6 to 22 carbons linked to each other by saturated bonds, and of which acids at least one is an acid with branched chain.

14. The method of claim 13, wherein the 2-oxetanone size is made from a mixture of a linear-chain and a branched-chain fatty acids.

15. The method of claim 13, wherein the 2-oxetanone size is made from a mixture of fatty acids with the proportion of linear-chain and branched-chain fatty acids in the order of 1 to 1.

16. The method of claim 13, wherein the 2-oxetanone size is made from a mixture of fatty acids with a fatty acid proportion of 40 % or higher of the at least one branched-chain fatty acid.

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17. The method of claim 13, wherein the at least one branched-chain fatty acid is isostearic acid.

*sub C3* 18. The method of claim 13, wherein the 2-oxetanone size is added in an amount of 0.05 to 0.25 of the fiber weight in the pulp slurry.

*sub D3* 19. The method of claim 13, including further a stock sizing step where a 2-oxetanone based stock size is used which is manufactured from greater number than one of fatty acids, the acids having a main chain comprising 6 to 22 carbons linked to each other by saturated bonds, and of which acids at least one is an acid with branched chain

20. The method of claim 13 further including a step of adding a filler material into the pulp slurry.

21. The method of claim 20, wherein the filler material is calcium carbonate.

22. The method of claim 20, wherein the filler material is precipitated calcium carbonate.

23. The method of claim 13 conducted under neutral conditions.

24. The method of claim 13 conducted under alkaline conditions.

25. A paper grade made using the method of claim 1.

26. A paper grade made using the method of claim 13.

27. A method of manufacturing a paper of mono- and multi-colour ink-jet printable grade by de-watering a

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paper web from fiber pulp slurry, the method containing a step of adding a 2-oxetanone size to the pulp slurry, in which size the fatty acid base consists of a greater number than one of fatty acids having a main chain comprising 6 to 22 carbons, the main chains of the acids dominantly being of thoroughly saturated type, but including in at least one of the acids a branching.

28. The method of claim 27, wherein the 2-oxetanone size is made from a mixture of a linear-chain and a branched-chain fatty acids.

29. The method of claim 27, wherein the 2-oxetanone size is made from a mixture of fatty acids with the proportion of linear-chain and branched-chain fatty acids in the order of 1 to 1.

30. The method of claim 27, wherein the 2-oxetanone size is made from a mixture of fatty acids with a fatty acid proportion of 40 % or higher of the at least one branched-chain fatty acid.

31. The method of claim 27, wherein the at least one branched-chain fatty acid is isostearic acid.

32. The method of claim 27, wherein the 2-oxetanone size is added in an amount of 0.05 to 0.25 of the fiber weight in the pulp slurry.

33. The method of claim 27 including further a step of adding a hydrophobizing size onto the de-watered web.

34. The method of claim 27 including further a step of adding a mineral filler material to the slurry.

35. The method of claim 38, wherein the filler material is calcium carbonate.

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~~36.~~  
~~40.~~ The method of claim 38, wherein the filler material is precipitated calcium carbonate.

~~37.~~  
~~41.~~ The method of claim 27 conducted under neutral conditions.

~~38.~~  
~~42.~~ The method of claim 27 conducted under alkaline conditions.

~~39.~~  
~~43.~~ A paper grade made using the method of claim 27.

~~40.~~  
~~44.~~ A 2-oxetanone based paper size manufactured from fatty acids having a main chain containing 6 to 22 carbons linked to each other by saturated bonds, and at least 40 % of the chains including a branching.

~~41.~~  
~~45.~~ A 2-oxetanone based paper size of claim 44 where 40 to 60 % of the fatty acids have a branched main chain.

~~42.~~  
~~46.~~ A 2-oxetanone based paper size of claim of claim 44 where the fatty acid with the branched main chain is isostearic acid.

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